

Form PTO-1449 (Rev. 8-88)	Attorney Docket No. ILL09-029-US	Serial No. 10/797,582
First Named Inventor: Jian-Ku Shang		
INFORMATION DISCLOSURE CITATION (Use several sheets if necessary)	Filing Date: March 10, 2004	Group: 1774

U.S. PATENT DOCUMENTS

Examiner Initials*		Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
Z1		2,670,334	02/1954	D'Alelio			
Z2		3,373,104	03/1968	Ryan			
Z3		3,395,970	08/1968	Machell			
Z4		3,520,805	07/1970	Ryan			
Z5		3,542,582	11/1970	Degginger			
Z6		3,676,173	07/1972	Adams			
Z8		3,853,721	12/1974	Darlington et al.			
Z9		3,903,220	09/1975	Economy et al.			
Z10		3,971,669	07/1976	Wrzesien et al.			
Z11		4,045,338	08/1977	Miyamoto et al.			
Z12		4,100,314	07/1978	Wallouch			
Z13		4,125,486	11/1978	Uzumaki et al.			
Z14		4,178,413	12/1979	DeMunda			
Z15		4,256,607	03/1981	Yoshida et al.			
Z16		4,265,768	05/1981	Beasley et al.			
Z17		4,285,831	08/1981	Yoshida et al.			
Z18		4,312,956	01/1982	Chong et al.			
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Z21		4,362,646	12/1982	Ikegami et al.			
Z22		4,476,191	10/1984	Girgis			

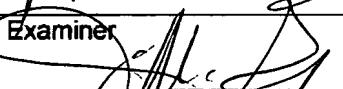
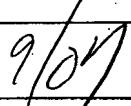
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	Z23	4,513,032	04/1985	Klinkowski			
	Z24	4,544,499	10/1985	Tran et al.			
	Z25	4,550,015	10/1985	Korb et al.			
	Z26	4,569,756	02/1986	Klein			
	Z27	4,693,828	09/1987	Yoshioka et al.			
	Z28	4,693,828	09/1987	Yoshioka et al.			
	Z29	4,740,540	04/1988	Kameda et al.			
	Z30	4,760,046	07/1988	Burger et al.			
	Z32	4,917,835	04/1990	Lear, et al.			
	Z33	4,983,451	01/1991	Sugino et al.			
	Z34	5,026,402	06/1991	Bose et al.			
	Z35	5,039,651	08/1991	Kosaka et al.			
	Z36	5,063,042	11/1991	Arita et al.			
	Z37	5,102,855	04/1992	Greinke et al.			
	Z38	5,143,756	09/1992	Cibulsky et al.			
	Z39	5,162,286	11/1992	MacDowall			
	Z40	5,204,310	04/1993	Tolles et al.			
	Z41	5,204,376	04/1993	Henmi et al.			
	Z42	5,206,207	04/1993	Tolles			
	Z43	5,212,144	05/1993	Schwartz, Jr.			
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	Z45	5,276,000	01/1994	Matthews et al.			
	Z46	5,277,802	01/1994	Goodwin			
	Z47	5,304,527	04/1994	Dimitri			
	Z48	5,318,846	06/1994	Bruening et al.			
	Z49	5,320,870	06/1994	Sorathla et al.			
	Z50	5,328,758	07/1994	Markell et al.			
	Z51	5,350,523	09/1994	Tomoi et al.			
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	Z55	5,424,042	06/1995	Mason et al.			
	Z56	5,451,444	09/1995	DeLiso et al.			
	Z57	5,482,915	01/1996	Golden et al.			
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	Z60	5,512,351	04/1996	Miyamichi et al.			
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	Z65	5,589,299	12/1996	Yamada et al.			
	Z66	5,614,459	03/1997	Mondragon et al.			

Examiner <i>[Signature]</i>	Date Considered <i>9/07</i>
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<i>JM</i>	Z67	5,707,471	01/1998	Petrak et al.			
	Z68	5,710,092	01/1998	Baker			
	Z69	5,759,942	06/1998	Tan et al.			
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	Z72	5,997,829	12/1999	Sekine et al.			
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	Z78	6,508,962	01/2003	Economy et al.			
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	Z82	2005/0221087	10/2005	Economy, et al.			
	Z83	2005/0202241	09/2005	Shang, et al.			
	Z84	3,799,796	03/1974	Hunter			
<i>JM</i>	Z85	2002/0074292	06/2002	Schlegel, et al.			

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Examiner Initials*		Document Number	Date	Country	Class	Subclass	Translation	
							Yes	No
<i>JM</i>	Y2	3339756 A1	05/1985	DE				X
	Y3	0 036 584 A2	09/1981	EP				X
<i>JM</i>	Y4	0 045 824 A1	02/1982	EP				

Examiner <i>JM</i>	Date Considered <i>907</i>
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Examiner Initials*		Document Number	Date	Country	Class	Subclass	Translation
							Yes No
	Y5	0 285 321 A2	10/1988	EP			
	Y6	0 608 539 A1	08/1994	EP			
	Y7	0 630 685 A1	12/1994	EP			X
	Y8	0 608 539 A1	08/1994	EP			
	Y11	1 415 853	11/1975	GB			
	Y13	WO 01/97973	12/2001	WO			
	Y14	WO 98/34723	08/1998	WO			
	Y15	WO 99/61384	12/1999	WO			
	Y18	WO 2005/087679	09/2005	WO			
	Y19	JP 56 0044039 A	04/1981	Japan			Abstract

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	Include, as applicable: Author, Title, Date, Publisher, Edition or Volume, Pertinent Pages	
	X1	"Ion Exchange", Kirk-Othmer Encyclopedia of Chemical Technology, 3 rd Ed., vol. 13, pp. 685-689 and 694, 1981.
	X2	Abstract for "Carborundum Process Converts Pitch Into Non-Flammable Fiber", Industrial Research vol. IR-100, Circle 231, 1 page, 1972.
	X3	Ahmadpour, et al., "The Preparation of Active Carbons from Coal by Chemical And Physical Activation", Carbon, vol. 34, No. 4, pp. 471-479, 1996.
	X4	Andreopoulos, et al., "Thermally Activated Phenolic Fibers", Chemistry of Materials, vol. 3, No. 4, pp. 594-597, 1991.
	X6	Ayles, "Phenolic", Modern Plastics Encyclopedia Handbook, pp. 78-80, 1994.
	X7	Carrott, et al., "Preparation of activated carbon 'membranes' by physical and chemical activation of cork", Carbon, vol. 37, pp. 515-517, 1999.
	X9	Dimotakis, et al., "Water Vapor Adsorption on Chemically Treated Activated Carbon Cloths", Chemistry of Materials, vol. 7, pp. 2269-2272, 1995.
	X10	Dominguez, et al., "Design of High Efficiency Polymeric Cation Exchange Fibers", Polym. Adv. Techol. 12, pp.197-205, 2001.
	X11	"Ion Exchangers", Dorfner, editor, pp. 28-45 and 206-285, 1990.
	X12	Economy, et al, "Adsorption Characteristics of Activated Carbon Fibers", Applied Polymer Symposium No. 29, 199-211, 1976.

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	X14	Economy, et al., "Tailoring Carbon Fibers for Adsorbing Volatiles", Chemtech, pp. 597-603, 1992.
	X15	Economy, "Now that's an interesting way to make a fiber!", Chemtech, vol. 10, pp. 240-247, 1980.
	X16	Economy, et al., "Polymeric Ion-Exchange Fibers", Ind. Eng. Chem. Res., 41, pp. 6436-6442, 2002.
	X18	Ermanlenko, et al., "Chemically Modified Carbon Fibers and Their Applications", VCH Publishers, pp. 59-73, 1990.
	X19	Feng, et al., "Functionalized Monolayers on Ordered Mesoporous Supports", Science, Vol. 276, pp. 923-926, 1997.
	X20	Foster, et al., "Adsorption Characteristics of Trace Volatile Organic Compounds in Gas Streams onto Activated Carbon Fibers", Chemistry of Materials, vol. 4, pp. 1068-1073, 1992.
	X21	Grynszpan, et al., "Synthesis and reactions of large-ring spirodienone calixarene derivatives", Pure & Appl. Chem., Vol. 68, No. 6, pp. 1249-1254, 1996.
	X24	Jagtoyen, et al., "Some Considerations of the Origins of Porosity in Carbons from Chemically Activated Wood", Carbon, vol. 31, No. 7, pp. 1185-1192, 1993.
	X26	Kunin, "Six Decades of Ion Exchange Technology at Rohm and Haas", Chemical Heritage 17:2, pp. 8, 9, 36-38, 1999.
	X27	Lee, et al., "Vapor adsorption on coal-and wood-based chemically activated carbons (II) adsorption of organic vapors", Carbon, vol. 37, pp. 15-20, 1999.
	X28	Lin, et al., "Extraction of Gold from Au(III) Ion Containing Solution by a Reactive Fiber", Journal of Applied Polymer Science, vol. 49, pp. 1635-1638, 1993.
	X29	Lin, et al., "Studies of the Preparation, Structure, and Properties of an Acrylic Chelating Fiber Containing Amidoxime Groups," Journal of Applied Polymer Science, vol. 47, pp. 45-52, 1993.
	X30	Lin, et al., "The Preparation and Properties of Activated Carbon Fibers Derived from Phenolic Precursor", Applied Polymer Symposium, No. 21, pp. 143-152, 1973.
	X32	Liu, et al., "Surfactant-Directed Synthesis of Nanoporous Thiol-Functionalized Organic-Inorganic Hybrid Fibers for Highly Selective Removal of Mercury", Polymeric Materials: Science & Engineering, 91, pp. 1037-1038, 2004.
	X33	Liu, et al., "Novel Polymeric Chelating Fibers for Selective Removal of Mercury and Cesium from Water", Environmental Science and Technology, vol. 37, No. 18, pp. 4261-4268, 2003.
	X34	"Glass fibers chelate heavy metals", Chemical & Engineering News, Vol. 81, No. 37, P. 21, 2003.
	X35	Liu, et al., "Hybrid Mesoporous Materials with Functionalized Monolayers", Chem. Eng. Technol., 21, pp. 97-100, 1998.
	X36	Liu, et al., "Hybrid Mesoporous Materials with Functionalized Monolayers", Adv. Mater., Vol. 10, No. 2, pp. 161-165, 1998.
	X37	Mercier, et al., "Heavy Metal Ion Adsorbents Formed by the Grafting of a Thiol Functionality to Mesoporous Silica Molecular Sieves: Factors Affecting Hg(II) Uptake", Environ. Sci. Technol., Vol. 32, No. 18, pp. 2749-2754, 1998.
	X38	Molina-Sabio, et al., "Development of Porosity in Combined Phosphoric Acid-Carbon Dioxide Activation", Carbon, vol. 34, No. 4, pp. 457-462, 1996.
	X39	Molina-Sabio, et al., "Porosity in Granular Carbons Activated with Phosphoric Acid", Carbon, vol. 33, No. 8, pp. 1105-1113, 1995.

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	X41	Odian, Principles of Polymerization, Third Edition John Wiley & Sons, pp. 125-132, 1991.
	X43	Rodriguez, "Table 15.11 Aldehyde condensation products", Principles of Polymer Systems, Fourth Edition, p. 638, 1996.
	X45	Search Report for Patent Cooperation Treaty application No. PCT/US 01/41081, 7 pages, Date of Mailing Nov. 9, 2001.
	X46	Search Report for Patent Cooperation Treaty application No. PCT/US 01/19952, 8 pages, Date of Mailing Nov. 14, 2001.
	X47	Search Report for Patent Cooperation Treaty application No. PCT/US 01/19946, 8 pages, Date of Mailing Nov. 14, 2001.
	X48	Solum, et al., "Evolution of Carbon Structure in Chemically Activated Wood", Carbon, vol. 33, No. 9, pp. 1247-1254, 1995.
	X50	Toles, et al., "Production of Activated Carbons from a Washington Lignite Using Phosphoric Acid Activation", Carbon, vol. 34, No. 11, pp. 1419-1426, 1996.
	X51	Molina-Sabio, et al., "Influence of the atmosphere used in the carbonization of phosphoric acid impregnated peach stones", Carbon, vol. 33, no. 8, pp.1180-1182, 1995.

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